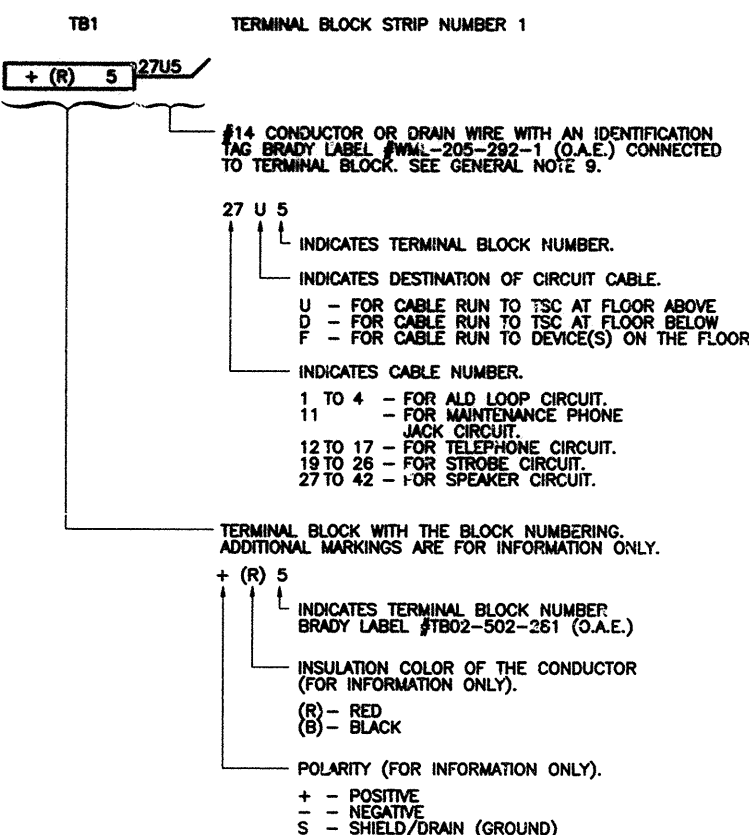


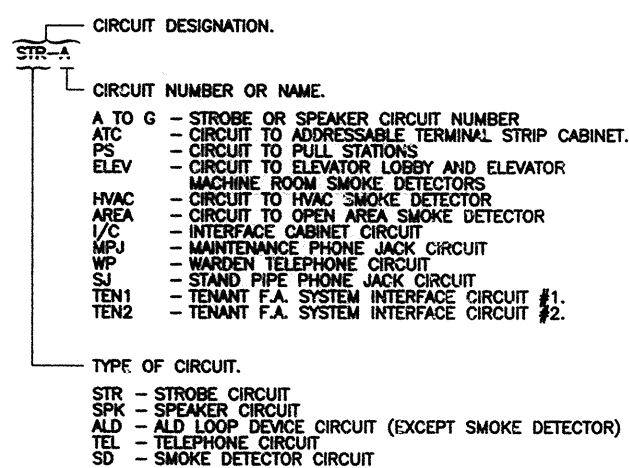
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
ALD	ANALOG LOOP DRIVER
ATC	ADDRESSABLE TERMINAL CABINET
CKT	CIRCUIT
cd	CANDELLA
DWG	DRAWING
EL	ELECTRIC
ELEV	ELEVATOR
EMR	ELEVATOR MACHINE ROOM
EOL	END OF LINE
EXST.	EXISTING
FA	FIRE ALARM
FL	FLOOR
F.C.O.	FUSE CUTOFF
F.M.C.	FLEXIBLE METALLIC CONDUIT
GND	GROUND
GSC	GALVANIZED STEEL CONDUIT
MER	MECHANICAL EQUIPMENT ROOM
MTD	MOUNTED
N.T.S.	NOT TO SCALE
O.A.E.	OR APPROVED EQUAL
PS	PULL STATION
P.B.	PULL BOX
SPK	SPEAKER
STR	STROBE
TA	TENANT AMPLIFIER
TD	ADDRESSABLE INTERFACE MODULE
TFA	TENANT FIRE ALARM PANEL
TSC	TERMINAL STRIP CABINET
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
W	WAIT
WTC	WORLD TRADE CENTER

TERMINATION LEGEND



CIRCUIT LEGEND



REMOVAL & PATCHING LEGEND

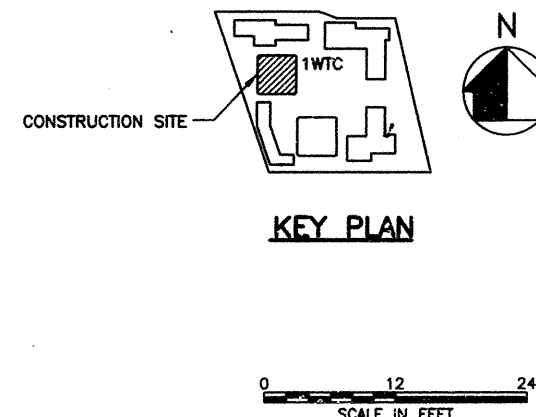
- EXISTING SMOKE DETECTOR IN SUSPENDED CEILING TO BE REMOVED AND CEILING PATCHED. PATCHING DETAIL AS INDICATED. SEE DWG. A-1
- EXISTING FIRE ALARM SPEAKER IN SUSPENDED CEILING TO BE REMOVED AND CEILING PATCHED. PATCHING DETAIL AS INDICATED. SEE DWG. A-1
- EXISTING FIRE ALARM STROBE TO BE REMOVED AND WALL PATCHED. FOR SURFACE MOUNTED STROBES ALSO REMOVE EXISTING ASSOCIATED CONDUIT AND WIRING PRIOR TO PATCHING.
- EXISTING FIRE ALARM SPEAKER IN SUSPENDED CEILING TO REMAIN, REFER TO PLAN FOR DETAIL.

LEGEND/SPECIFICATION

- HEAVY LINE INDICATES WORK TO BE DONE
- HEAVY DASHED LINE INDICATES DEVICE AND/OR CIRCUITRY TO BE REMOVED
- LIGHT LINE INDICATES EXISTING DEVICE AND/OR CIRCUITRY TO REMAIN
- FIRE ALARM CABLE RUN ABOVE CEILING
- FIRE ALARM CABLE IN 3/4" GALVANIZED STEEL CONDUIT.
- CABLE ENTERING LENGTH OF 3/4" GALVANIZED STEEL CONDUIT. END OF CONDUIT TO HAVE BUSHING.
- NUMBER OF CABLES
- TYPE OF CABLE:
- A - 2#14 AWG 200°C, SHIELDED TWISTED PAIR TEFLON CABLE, CLASS E, AND BSA APPROVED N.Y.C. FOR LOCAL LAW #5.
- B - 2#14 AWG 200°C, UNSHIELDED TWISTED PAIR TEFLON CABLE, CLASS E, AND BSA APPROVED N.Y.C. FOR LOCAL LAW #5.
- RECESSED CEILING MOUNTED ROUND SPEAKER, WHEELOCK MODEL #E90-W WITHOUT SUBSTITUTION. TAP SETTING AS INDICATED. SEE INSTALLATION DETAIL "A" ON DWG. E-2.
- STROBE (FLUSH MOUNTED U.O.N.). THE NUMERAL INDICATES STROBE CANDELLA RATING, TYPE AND MODEL # AS FOLLOWS:
- 15cd - 15 CANDELLA STROBE, WHEELOCK MODEL #RSS-2415W-FR WITHOUT SUBSTITUTION.
- 30cd - 30 CANDELLA STROBE, WHEELOCK MODEL #RSS-2430W-FR WITHOUT SUBSTITUTION.
- 75cd - 75 CANDELLA STROBE, WHEELOCK MODEL #RSS-2475W-FR WITHOUT SUBSTITUTION.
- 110cd - 110 CANDELLA STROBE, WHEELOCK MODEL #RSS-24110W-FR WITHOUT SUBSTITUTION.
- SEE INSTALLATION DETAILS "B" AND "C" ON DWG. E-2.
- SURFACE MOUNTED COMBINATION STROBE/SPEAKER UNIT (SURFACE MOUNTED U.O.N.), LISTED WITH RESPECTIVE CANDELLA RATED STROBE, AND INSTALLED USING BACK BOX WHEELOCK MODEL #SBB, WITHOUT SUBSTITUTIONS. THE NUMERAL WITH SUFFIX "W" INDICATES SPEAKER TAP SETTING AND SUFFIX "cd" INDICATES STROBE CANDELLA RATING AS FOLLOWS:
- 15cd - 15 CANDELLA STROBE WITH SPEAKER, WHEELOCK MODEL #E70-2415W-FR WITHOUT SUBSTITUTION.
- 30cd - 30 CANDELLA STROBE WITH SPEAKER, WHEELOCK MODEL #E70-2430W-FR WITHOUT SUBSTITUTION.
- 75cd - 75 CANDELLA STROBE WITH SPEAKER, WHEELOCK MODEL #E70-2475W-FR WITHOUT SUBSTITUTION.
- 110cd - 110 CANDELLA STROBE WITH SPEAKER, WHEELOCK MODEL #E70-24110W-FR WITHOUT SUBSTITUTION.
- SEE APPLICABLE INSTALLATION DETAILS "C" AND "D" ON DWG. E-2.
- CEILING MOUNTED COMBINATION SPEAKER-STROBE. MOUNT ON CEILING GRID. RATED CANDELLA STROBE AND RATED WATTAGE SPEAKER, WHEELOCK MODEL #E90-2415C-FW WITHOUT SUBSTITUTION.
- ALD LOOP DEVICE ADDRESS: FIRST THREE DIGITS REPRESENT NETWORK/LOOP ADDRESS (AS DIRECTED BY ENGINEER), AND LAST THREE DIGITS REPRESENT DEVICE ADDRESS.
- ADDRESSABLE SMOKE DETECTOR PYROTRONICS MODEL #FP-11 WITH MOUNTING BASE PYROTRONICS MODEL #DB-11 WITHOUT SUBSTITUTIONS. "XXX" REPRESENTS LAST THREE DIGIT DEVICE ADDRESS ONLY. CONTRACTOR SHALL TAG DETECTOR HEAD AND BASE WITH COMPLETE SIX DIGIT DEVICE ADDRESS (INCLUDING NETWORK/LOOP AND DEVICE ADDRESSES) AS SHOWN ABOVE. THE SINGLE DIGIT NUMERAL INDICATES INSTALLATION METHOD AS FOLLOWS:
- R - PLENUM MOUNTED (IN FRONT OF RETURN AIR GRILL). FOR INSTALLATION, SEE DETAIL "F" ON CONTRACT DRAWING E-2 AND INSTRUCTION ON DRAWING M-1.
- D - DUCT MOUNTED WITH HOUSING AND SAMPLING TUBE PYROTRONICS MODEL #AD-31LP AND STAB-X, WITHOUT SUBSTITUTIONS. SAMPLING TUBE SIZE TO BE FIELD DETERMINED BASED ON THE DUCT SIZE. FOR INSTALLATION, SEE DETAIL "H" ON DRAWING E-2 AND INSTRUCTIONS ON DRAWING M-1.
- 1 - SUSPENDED CEILING/GYPSUM BOARD. FOR INSTALLATION, SEE DETAIL "E" ON DRAWING E-2.
- 2 - SURFACE MOUNTED (FOR OPEN CEILING AREA ONLY). FOR INSTALLATION, SEE DETAIL "G" ON DRAWING E-2.
- ADDRESSABLE INTERFACE MODULE (TRI) PYROTRONICS MODEL #TRI-B6D, WITHOUT SUBSTITUTION. FOR MOUNTING TYPE AND INSTALLATION, SEE APPLICABLE DETAIL "I" OR "J" ON DRAWING E-2.
- PULL BOX
- EXISTING TENANT AMPLIFIER
- EXISTING TENANT FIRE ALARM PANEL
- EXISTING TERMINAL STRIP CABINET
- EXISTING ADDRESSABLE TERMINAL CABINET

GENERAL NOTES

- ALL FIRE ALARM CABLES SHALL BE TYPE FPLP-UL TWISTED PAIR #14 GAUGE SOLID COPPER, 200°C, 600V, SHIELDED (EXCEPT FOR SPEAKERS WHICH USE UNSHIELDED), INSULATED CONDUCTORS, CLASS "E", BSA AND MEA APPROVED FOR NYC LOCAL LAW #5 WITH FEP (TEFLON OR APPROVED EQUAL) INSULATION, AND CONDUCTORS COLORED BLACK & RED. ALL CABLES SHALL BE INSTALLED ABOVE HUNG CEILING/SHEETROCK CEILING AND MOUNTED AND SUPPORTED ABOVE CEILINGS WITHOUT CONDUITS UNLESS OTHERWISE NOTED.
- ASSEMBLE DRAIN WIRE AT BOTH ENDS OF SHIELDED CABLES USING TYPICAL SHIELD/DRAIN INSULATING METHOD AS SHOWN ON DRAWING E-3. SHIELD MUST BE CONTINUOUS THROUGHOUT THE CIRCUIT AND INSULATED.
- PROGRAMMING OF BASE BUILDING SYSTEM FIRE ALARM PANELS WILL BE BY THE AUTHORITY. PROGRAMMING OF ALL ADDRESSABLE DEVICES (SMOKE DETECTORS & TRI'S) SHALL BE BY THE CONTRACTOR. FINAL CONFIRMATION OF ADDRESSES SHALL BE AS DIRECTED BY ENGINEER, PRIOR TO PROGRAMMING DEVICES.
- SET TAP SETTINGS ON ALL SPEAKERS (AS SHOWN ON DWG'S), PRIOR TO INSTALLATION.
- ALL CONDUITS SHALL BE RIGID STEEL, HOT DIPPED GALVANIZED WITH THREADED FITTINGS (U.O.N.).
- ALL PENETRATIONS MADE IN EXISTING FIRE ALARM EQUIPMENT SHALL BE MADE IN THE PRESENCE OF THE ENGINEER. NO TOP PENETRATIONS SHALL BE MADE IN ANY FIRE ALARM PANELS.
- PATCH & SEAL PENETRATIONS FROM ALL CONDUITS PASSING THRU WALLS AND PLENUMS, WITH THERMAFIBER (O.A.E.).
- FOR MOUNTING DETAILS AND WIRING DIAGRAMS OF SPEAKERS, STROBES, SMOKE DETECTORS AND TRI'S SEE DWG E-2. NO "T" TAPPING WILL BE PERMITTED. ALL BOX COVERS, CONDUIT COVERS, ETC. SHALL BE PAINTED RED.
- SHAPING AND LABELING OF ALL CABLES AND FINAL CONNECTIONS IN THE TSC AND ATC CABINETS SHALL BE PERFORMED BY THE CONTRACTOR. THIS WORK SHALL BE DONE IN THE PRESENCE OF THE ENGINEER.
- CONTRACTOR SHALL USE BRADY LABELS #WML-205-292-1 (O.A.E.) FOR LABELLING OF ALL CONDUCTORS AND #WML-305-292 (O.A.E.) FOR LABELING OF ALL CABLES.
- UNDER THE DIRECTION OF THE ENGINEER, CONTRACTOR SHALL REMOVE EXISTING SPEAKERS, STROBES, AND SMOKE DETECTORS ONLY AFTER DEVICES TO BE INSTALLED ARE OPERATIONAL.
- U.O.N., ALL EQUIPMENT SHOWN TO BE REMOVED SHALL HAVE ITS ASSOCIATED TERMINATION WIRING ABANDONED AND TAPED IN PLACE. ENDS OF ABANDONED CABLES SHALL BE TAGGED "NOT IN USE".
- PRIOR TO INSTALLATION CONTRACTOR SHALL TEST, IN THE PRESENCE OF THE ENGINEER, ALL REELS OF FIRE ALARM CABLES FOR CONTINUITY AND SHORT CIRCUITS.
- FIRE ALARM CABLES SHALL BE TESTED IN ACCORDANCE TO THE AUTHORITY'S ENGINEERING SPECIFICATION 16910. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- SMOKE DETECTORS ARE REQUIRED AT ALL RETURN AIR GRILLS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON DISCOVERING ANY RETURN AIR GRILL NOT SHOWN ON THE CONTRACT DRAWINGS.
- AS SOON AS ACCESS TO THE CEILING AREA IS NO LONGER REQUIRED FOR THE INSTALLATION AND TESTING OF WIRING AND DEVICES, CONTRACTOR SHALL REPLACE ALL REMOVED CEILING TILES AND PATCH CEILING IN ACCORDANCE WITH CONTRACT DRAWING A-1.
- ALL FINISHES DISTURBED BY THE INSTALLATION OF DEVICES OR WIRING SHALL BE RESTORED TO THEIR ORIGINAL OR MATCHING CONDITION AT NO COST TO THE AUTHORITY.
- CONTRACTOR SHALL COORDINATE DEVICE PENETRATIONS WITH ENGINEER FOR ALL NON-DRYWALL FACED WALLS.
- CENTER ALL CORRIDOR CEILING SPEAKERS IN EXISTING CEILING TILE.
- IF ASBESTOS CONTAINING MATERIAL IS ENCOUNTERED AND IF DIRECTED BY THE ENGINEER TO REMOVE SUCH ASBESTOS CONTAINING MATERIAL AND REPLACE SUCH MATERIAL WITH NON-ASBESTOS CONTAINING MATERIAL, THE CONTRACTOR SHALL REMOVE SUCH ASBESTOS CONTAINING MATERIAL AND REPLACE SUCH MATERIAL WITH NON-ASBESTOS CONTAINING MATERIAL. THE CONTRACTOR WILL BE COMPENSATED FOR REMOVING SUCH ASBESTOS CONTAINING MATERIAL AND REPLACING SUCH MATERIAL WITH NON-ASBESTOS CONTAINING MATERIAL AT THE NET COST OF SUCH WORK.
- NET COST SHALL BE COMPUTED IN THE SAME MANNER AS IS COMPENSATION FOR EXTRA WORK, INCLUDING ANY PERCENTAGE ADDITION TO COST, AS SET FORTH IN THE CLAUSE OF THE CONTRACT PROVIDING COMPENSATION FOR EXTRA WORK. PERFORMANCE OF SUCH NET COST WORK SHALL BE SUBJECT TO ALL PROVISIONS OF THE CONTRACT RELATING TO PERFORMANCE OF EXTRA WORK. COMPENSATION FOR SAID NET COST WORK SHALL NOT BE CHARGED AGAINST THE TOTAL AMOUNT OF COMPENSATION ALLOWED FOR SUCH WORK.



THE PORT AUTHORITY
OF NY & NJ

ENGINEERING PROGRAM MANAGER
WORLD TRADE
CENTER
CHIEF ELECTRICAL ENGINEER

1 8/23/99 AS-BID
No. Date Revision Approved

ENGINEERING DEPARTMENT
DESIGN DIVISION

WORLD
TRADE
CENTER

ELECTRICAL

Title
FIRE ALARM SYSTEM
DEVICE UPGRADE
PHASE III
1 WORLD TRADE CENTER
CONTRACT NO. 3

LEGEND/SPECIFICATION,
CIRCUIT LEGEND,
TERMINATION LEGEND
AND GENERAL NOTES

This drawing subject to conditions in Contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

S.FELDSSTEIN R.DUKESHIRE A.S.
Designed by Drawn by Checked by

AUGUST 9, 1999

Date

WTC-861.176

Contract Number Drawing Number

E-1